

THAT WHICH IS CLAIMED:

1. A store ejection system for mounting a jettisonable store, the store ejection system using a gas as the source of energy and the transfer mechanism and comprising:
  - 5 an on-board pressure vessel of pressurized non-pyrotechnic gas for providing the source of energy and the transfer mechanism;  
a releasable valve configured to hermetically seal the pressure vessel, the releasable valve having an adjustable valve member adapted to be adjusted from a closed position to an open position, thereby releasing the gas from the vessel;
  - 10 an actuation system comprising an accumulator configured to be fluidly connected to the pressure vessel to receive and store the gas from the pressure vessel, a dump valve for controlling a flow of gas from the accumulator, and a controller for actuating the dump valve to an open position in response to a control signal to jettison the store;
  - 15 a pneumatically-driven jettison mechanism for releasably retaining the store, the jettison mechanism fluidly connected to the dump valve such that actuating the dump valve to the open position releases the pressurized gas in the accumulator to flow to the jettison mechanism, thereby actuating the jettison mechanism to jettison the store; and
  - 20 a valve actuator configured to receive a signal from the controller and adjust the valve member from the closed position to the open position in response to the signal from the controller after the pressure vessel is installed in the system such that the releasable valve hermetically seals the pressure vessel until the pressure vessel is installed in the system and the controller issues the signal to the valve actuator.
- 25 2. A store ejection system according to Claim 1 wherein the releasable valve has a valve body defining an aperture extending between an inlet and outlet and providing a passage for the gas from the pressure vessel at least partially to the accumulator, the adjustable valve member being slidably adjustable in the aperture from the closed position to the open position, the adjustable valve member in the closed position being  
30 biased against the valve body to seal the aperture.

3. A store ejection system according to Claim 2 wherein the adjustable valve member is configured to slide toward an internal space of the pressure vessel to open the valve and fluidly connect the pressure vessel to the accumulator such that the gas in the pressure vessel biases the adjustable valve member to the closed position.
- 5 4. A store ejection system according to Claim 2, further comprising a spring configured to bias the adjustable valve member to the closed position.
5. A store ejection system according to Claim 2, further comprising a lock spring member configured to open when the adjustable valve member is adjusted to the open position, the lock spring member thereby locking the adjustable valve member in the  
10 open position.
6. A store ejection system according to Claim 2 wherein the valve actuator is configured to advance a plunger in response to the signal from the controller, the plunger configured to linearly adjust the adjustable member to the open position.
7. A store ejection system according to Claim 1 wherein the pressure vessel is  
15 configured to be substantially directly fluidly connected to the accumulator such that the gas is delivered from the pressure vessel to the accumulator with a substantially uniform pressure therebetween.
8. A store ejection system according to Claim 1 wherein the actuation system further includes a relief valve for venting the gas from the accumulator.
- 20 9. A store ejection system according to Claim 1 wherein the jettison mechanism further comprises at least one hook for releasably retaining the store; each hook configured to be actuated to release the store from the jettison mechanism by the pressurized gas exiting the accumulator through the dump valve.
10. A store ejection system according to Claim 9 wherein the jettison mechanism  
25 further comprises at least one ejector piston for forcibly jettisoning the store when the hook has been actuated to a release position, each ejector piston being actuated to jettison the store by the pressurized gas exiting the accumulator through the dump valve.

11. A store ejection system according to Claim 1 wherein the releasable valve is fixedly attached to the pressure vessel and the valve is configured to be non-resealable after the valve member is actuated to the open position.
12. An apparatus for providing a non-pyrotechnic gas for a store ejection system using the gas as the source of energy and the transfer mechanism, the apparatus comprising:
- a pressure vessel defining an internal space for holding the non-pyrotechnic gas; and
  - a releasable valve comprising:
    - a valve body defining an aperture extending between an inlet and outlet and providing a passage for the gas to exit the internal space of the pressure vessel;
    - an adjustable valve member being slidably mounted in the aperture and adapted to be adjusted from a closed position in which the adjustable valve member hermetically seals the aperture to an open position to release gas from the vessel, the adjustable valve member being configured to slide toward the internal space of the pressure vessel to open the valve such that the gas in the pressure vessel biases the adjustable valve member to the closed position; and
    - a lock spring member configured to open when the adjustable valve member is adjusted to the open position, the lock spring member thereby locking the adjustable valve member in the open position.
13. An apparatus according to Claim 12, further comprising a spring configured to bias the adjustable valve member to the closed position.
14. An apparatus according to Claim 12, further comprising a threaded connection portion extending annularly around the valve body such that the valve body can be connected to the store ejection system and the gas can be delivered from the pressure vessel to the ejection system.
15. An apparatus according to Claim 12 wherein the valve body is fixedly attached to the pressure vessel and the releasable valve is configured to be non-resealable after the valve member is actuated to the open position.

16. A method of ejecting stores using a gas as the source of energy and the transfer mechanism, the method comprising:
- releasably retaining a store with a pneumatically-driven jettison mechanism;
  - releasably connecting an on-board pressure vessel of pressurized non-  
5 pyrotechnic gas to an accumulator;
  - actuating a valve actuator to adjust a valve member of a releasable valve of the pressure vessel such that the pressure vessel is fluidly connected to the accumulator;
  - and
  - actuating a dump valve fluidly connected to the accumulator to an open  
10 position to fluidly connect the accumulator to the jettison mechanism such that the gas flows from the accumulator to the jettison mechanism and thereby actuates the jettison mechanism to jettison the store.
17. A method according to Claim 16 wherein said step of actuating the valve actuator comprises sliding the valve member in an aperture defined by a valve body of  
15 the releasable valve toward an internal space of the pressure vessel.
18. A method according to Claim 18, further comprising prior to said actuating steps providing gas pressure against the valve member and thereby biasing the valve member to a closed position against the valve body.
19. A method according to Claim 18, further comprising biasing the valve  
20 member in a closed position against the valve body with a spring.
20. A method according to Claim 16, further comprising opening a lock spring member when the adjustable valve member is adjusted to the open position, the lock spring member thereby locking the adjustable valve member in the open position.
21. A method according to Claim 16 wherein said steps of releasably connecting  
25 the pressure vessel and actuating the valve actuator comprise fluidly connecting the pressure vessel substantially directly to the accumulator such that the gas is delivered from the pressure vessel to the accumulator with a substantially uniform pressure therebetween.

22. A method according to Claim 16, further comprising venting the gas from the accumulator through a relief valve to maintain a predetermined pressure in the accumulator.
23. A method according to Claim 16 wherein said step of actuating the valve  
5 actuator comprises advancing a plunger of the actuator to linearly adjust the adjustable member to the open position.
24. A method according to Claim 16, further comprising prior to said connecting step pressurizing the pressure vessel and hermetically sealing the pressure vessel with the releasable valve.
- 10 25. A method according to Claim 16 wherein said retaining step comprises releasably retaining the store with at least one hook and wherein said step of actuating the dump valve comprises actuating the hook to an open position to release the store.
26. A method according to Claim 16 wherein said step of actuating the dump  
15 valve comprises fluidly connecting the accumulator to at least one ejector piston such that the gas flowing from the accumulator actuates each ejector piston to jettison the store.
27. A method according to Claim 16, further comprising subsequent to said actuating steps, disposing the pressure vessel and repeating said connecting step with another pressure vessel of pressurized non-pyrotechnic gas.
- 20 28. A method according to Claim 16 wherein said step of actuating the valve actuator is performed after a decision is made to eject the store.